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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,360	02/10/2004	Liang-Sheng Liao	87450RLO	1223

7590
Pamela R. Crocker
Patent Legal Staff
Eastman Kodak Company
343 State Street
Rochester, NY 14650-2201

EXAMINER

LIN, JAMES

ART UNIT	PAPER NUMBER
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1792

MAIL DATE	DELIVERY MODE
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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/775,360	Applicant(s) LIAO ET AL.	
	Examiner Jimmy Lin	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-10 and 12-15 is/are pending in the application.
- 4a) Of the above claim(s) 7-10 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6 and 13-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/06/2008 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 5, 6, 13, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Himeshima et al. (U.S. Publication No. 2001/0004469).

Himeshima discloses a method of making a second electrode for an organic EL device, wherein the second electrode can be an alloy of gold, silver, copper, tin, aluminum, and indium [0062]. The vacuum vapor deposition of the second electrode can be performed using a single evaporation source [0093]. The vacuum vapor deposition necessarily includes the steps of heating the evaporation source and evaporating the source materials.

Himeshima does not explicitly teach that the differences of the vapor pressure between each of the evaporation materials are within two orders of magnitudes. However, the present specification exemplifies aluminum in combination with tin, copper, or gold (claim 5) and silver in combination with aluminum or indium (claim 6). Himeshima discloses such combinations. Thus, the vapor pressure of these metals must necessarily be within two orders of magnitude.

Claims 13,15: Himeshima would have suggested mixing the evaporation materials together in an evaporation source having at least one compartment.

4. Claims 1, 5, 13, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 97/08744 (references made are to the English equivalent U.S. Publication No. 2004/0238891; hereinafter "Nakamura").

Nakamura discloses a method of making a metal film of an alloy of aluminum and copper. The metal film is used as wiring (i.e., an electrode) [0022]. The metal film can be formed in a vacuum evaporation method and a single evaporation source can be used [0023]. The vacuum evaporation method necessarily includes the steps of heating the evaporation source and evaporating the source materials.

Nakamura does not explicitly teach that the differences of the vapor pressure between each of the evaporation materials are within two orders of magnitudes. However, the present specification exemplifies aluminum in combination with copper (claim 5). Nakamura discloses such a combination. Thus, the vapor pressure of these metals must necessarily be within two orders of magnitude.

Claims 13,15: Nakamura would have suggested mixing the evaporation materials together in an evaporation source having at least one compartment.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 5-6, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hosokawa et al. (U.S. Publication No. 2003/0018218) in view of Liao et al. (U.S. Publication No. 2003/0152801).

Hosokawa discloses a method of forming an organic EL device (abstract). The EL device can include an electrode made from a combination of aluminum with gold (as required in claim 5) or aluminum with silver (as required in claim 6). The composition of the alloy is controlled by the temperature of the vapor deposition (i.e., heating the evaporation source) and

the degree of vacuum is suitably selected (i.e., pumping the evaporation chamber down to a predetermined vacuum condition) [0052].

Hosokawa does not explicitly teach that the differences of the vapor pressure between the electrode materials are within two orders of magnitudes at a selected evaporation temperature. However, the present specification exemplifies 1) aluminum and gold and 2) aluminum and silver preferred mixtures of the present invention and, thus, the vapor pressures of these metals must necessarily be within two orders of magnitudes.

Hosokawa seems to suggest that the evaporation materials are placed in different evaporation sources, but does not explicitly teach placing the evaporation materials in a single evaporation source. However, Liao teaches that dual source evaporation is necessarily more complicated than single source evaporation [0004]. Such a teaching would have suggested that the use of a single evaporation source would have been less complicated than the use of multiple evaporation sources. More specifically, the teaching would have suggested that the evaporation of magnesium with silver or aluminum would have been less complicated if they were placed in a single evaporation source as compared to using separate evaporation sources for each evaporation material. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have performed the evaporation of the electrode materials of Hosokawa using a single evaporation source method, as opposed to a dual evaporation source method, with a reasonable expectation of success. One would have been motivated to do so in order to have performed a less complicated evaporation process.

Claims 13,15: Liao would have suggested mixing the evaporation materials together in an evaporation source having at least one compartment.

7. Claims 1, 4-6, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grace et al. (U.S. Publication No. 2002/0196401) in view of Hosokawa '218 and Liao '801.

Grace teaches a method of making an LCD device (abstract). An electrode containing magnesium and zinc (as required in claim 4), aluminum and gold (as required in claim 5), or aluminum and silver (as required in claim 6) can be formed on the LCD substrate [0051].

Grace does not explicitly teach c) pumping the evaporation chamber down to a predetermined vacuum condition and d) heating the evaporation source to a predetermined

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temperature and evaporating the materials. However, Hosokawa teaches that it was well known in the art to have vapor deposited electrode materials in a vacuum environment [0052]. Because Hosokawa teaches that such methods were operable for forming electrodes, it would have been obvious to one of ordinary skill in the art at the time of invention to have vapor deposited the electrode materials of Grace in a vacuum chamber with a reasonable expectation of success.

Grace does not explicitly teach that the evaporation materials are placed in a single evaporation. However, Liao teaches that dual source evaporation is necessarily more complicated than single source evaporation [0004]. Such a teaching would have suggested that the use of a single evaporation source would have been less complicated than the use of multiple evaporation sources. More specifically, the teaching would have suggested that the evaporation of magnesium with silver or aluminum would have been less complicated if they were placed in a single evaporation source as compared to using separate evaporation sources for each evaporation material. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have performed the evaporation of the electrode materials of Grace using a single evaporation source method, as opposed to a dual evaporation source method, with a reasonable expectation of success. One would have been motivated to do so in order to have performed a less complicated evaporation process.

8. Claims 1, 4-6, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grace '401 in view of Himeshima '469.

Grace is discussed above, but does not explicitly teach placing the evaporation materials in a single evaporation source, pumping the evaporation chamber down to a predetermined vacuum condition, and heating the evaporation source to a predetermined temperature and evaporating the materials. However, Himeshima teaches that it was well known in the art of forming an electrode to have placed the evaporation materials in a single evaporation source and to have formed the electrode by vacuum vapor deposition [0093]. Because Himeshima teaches that such methods were operable in the art, it would have been obvious to one of ordinary skill in the art at the time of invention to have formed placed the evaporation materials of Grace in a single evaporation source and to have heated and evaporated the evaporation materials of Grace in a vacuum vapor deposition method with a reasonable expectation of success.

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hosokawa '218 in view of Liao '801 as applied to claim 1 above, and further in view of Yamamoto et al. (U.S. Patent No. 6,179,923).

Hosokawa does not explicitly teach monitoring the total evaporation rate to a predetermined value by adjusting the applied electrical power, opening a shutter to start evaporation, closing the shutter when the thickness of the electrode layer has reached a predetermined value, and turning off the power supply. However, Yamamoto teaches that it was well known to use a shutter to allow vapor flow from the source materials to pass or to be blocked at the start or end of deposition (col. 4, lines 30-33). The heater is operated by a power supply connected to the heater (col. 7, lines 43-47). Power is supplied to the heater to effect evaporation and the power is turned off when the deposition is complete. Adjusting the power of the heater necessarily controls the evaporation rate of the evaporation materials. Because Yamamoto teaches that such steps were operable in the art of vapor deposition, it would have been obvious to one of ordinary skill in the art at the time of invention to have adjusted the power supply, opened the shutter, closed the shutter, and turned off the power supply in the vapor deposition method of Hosokawa with a reasonable expectation of success.

10. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grace '401 in view of Hosokawa '218 and Liao '801 as applied to claim 1 above, and further in view of Yamamoto '923 for substantially the same reasons as discussed immediately above.

11. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grace '401 in view of Himeshima '469 as applied to claim 1 above, and further in view of Yamamoto '923 for substantially the same reasons as discussed immediately above.

12. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Himeshima '469 as applied to claim 1 above, and further in view of Yamamoto '923 for substantially the same reasons as discussed immediately above.

13. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura '744 as applied to claim 1 above, and further in view of Yamamoto '923 for substantially the same reasons as discussed immediately above.

14. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hosokawa '218 in view of Liao '801 as applied to claim 1 above, and further in view of Yamazaki et al. (U.S. Publication No. 2003/0162314).

Hosokawa does not explicitly teach that the evaporation materials are placed separately into each of the compartments in the evaporation source. However, Yamazaki teaches that it was well known in the art to use a single evaporation source 201 having multiple compartments to hold different evaporation materials (Fig. 6). The evaporation source can hold evaporation source 203a and evaporation source 203b in separate compartments [0070]. One of ordinary skill in the art would have recognized that any evaporation source capable of holding both the evaporation materials would have been operable for forming the electrode film of Liao and Hosokawa. Because Yamazaki teaches that such an evaporation source was operable in the art of vapor deposition and because one of ordinary skill in the art would have expected that placing each evaporation material in separate compartments of a single evaporation source would have been operably equivalent to placing all the evaporation materials into a single compartment, it would have been obvious to one of ordinary skill in the art at the time of invention to have used the evaporation source having multiple compartments as the particular evaporation source of Hosokawa and Liao and to have placed each evaporation material in a different compartment with a reasonable expectation of success. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

15. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grace '401 in view of Hosokawa '218 and Liao '801 as applied to claim 1 above, and further in view of Yamazaki '314 for substantially the same reasons as discussed immediately above.

16. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grace '401 in view of Himeshima '469 as applied to claim 1 above, and further in view of Yamazaki '314 for substantially the same reasons as discussed immediately above.

17. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Himeshima '469 as applied to claim 1 above, and further in view of Yamazaki '314 for substantially the same reasons as discussed immediately above.

18. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura '744 as applied to claim 1 above, and further in view of Yamazaki '314 for substantially the same reasons as discussed immediately above.

Response to Arguments

19. Applicant's arguments filed 11/6/2008 have been fully considered but they are not persuasive.

Applicant argues on pg. 4 that Liao does not teach or suggest how to make alloy cathodes using a single source and that the Mg/Ag or Mg/Al alloys described in Liao cannot be effectively used in a single evaporation source because of the large difference in vapor pressure. Applicant additionally notes that the Declarations under 1.132 from Mr. Steven Van Slyke and Dr. Liang-Sheng Liao state that the evaporation of Mg and Ag (or Al) from a single crucible would render the device inoperable. However, the grounds of rejection are based on the combination of 1) Hosokawa and Liao and 2) Grace, Hosokawa, and Liao. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The Liang reference would have reasonably suggested to one of ordinary skill in the art that the use of a single source would have been advantageous over the use of a plurality of sources. One of ordinary skill in the art would have applied those advantages to the methods of Hosokawa and Grace with a reasonable expectation of success and with predictable results.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is (571)272-8902. The examiner can normally be reached on Monday thru Friday 8AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jimmy Lin/
Examiner, Art Unit 1792

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit
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